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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/578,333

05/04/2006

Wilhelm Rademacher

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5693

45473

7590

12/22/2010

BRINKS, HOFER, GILSON & LIONE

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RESEARCH TRIANGLE PARK, NC 27709

EXAMINER

SCHLENTZ, NATHAN W

ART UNIT

PAPER NUMBER

1616

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/578,333	<b>Applicant(s)</b> RADEMACHER ET AL.	
	<b>Examiner</b> Nathan W. Schlientz	<b>Art Unit</b> 1616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 8-19 is/are pending in the application.
- 4a) Of the above claim(s) 11-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-10 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/28/10</u>  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 28 October 2010 has been entered.

### ***Status of the Claims***

Claims 8-19 are pending in the present application. Claims 11-18 are withdrawn as being drawn to nonelected subject matter. Thus, claims 8-10 and 19 are examined herein on the merits in so far as they are drawn to the elected species.

### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 28 October 2010 was filed concurrently with the RCE. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has been considered by the examiner.

***Response to Amendment***

The declaration under 37 CFR 1.132 filed 28 October 2010 is insufficient to overcome the rejection of claims 8-10 and 19 based upon Bartlett et al., Gullino et al., Müller et al., Rademacher et al., Elad, and Grover et al. as set forth herein below for the reasons discussed below.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1,148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
1. Claims 8-10 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Bartlett et al. (Pest Management Science, 2002), Gullino et al. (Crop Protection, 2000), Müller et al. (WO 97/40688), Rademacher et al. (US 5,869,424), Elad (Netherlands Journal of Plant Pathology, 1993), and Grover et al. (Plant Physiology, 1976).

*Determination of the scope and content of the prior art*

*(MPEP 2141.01)*

Bartlett et al. teach pyraclostrobin as one of six commercially available strobilurins for agricultural use, which are one of the most important classes of agricultural fungicides (Abstract). Bartlett et al. further state that the strobilurins, such as pyraclostrobin, have been extremely successful because of the benefits that they bring and are clearly one of the most valuable classes of single-site fungicide ever discovered by the agrochemical industry (pg. 660, Conclusions). Bartlett et al. also teach that there has been consistently greater yield from strobilurin-based cereal fungicide programmes compared with azole-based programmes in situations where both spray-programmes have delivered similar levels of visible disease control or where there has been seemingly insufficient difference in visible disease control, termed the strobilurin “greening effect” (pg. 656, left column, 2<sup>nd</sup> paragraph). One reasoning for the “greening effect” has been that strobilurins are found to affect a variety of physiological processes, such as ACC synthase and thereby ethylene biosynthesis (pg. 656, paragraph bridging the two columns). Bartlett et al. further teach that azoles in combination with kresoxim-methyl, a strobilurin, gave similarly good fungal control but significantly better prevention of leaf necrosis (pg. 656, right column).

Gullino et al. teach that in addition to the strobilurin's direct effect on pathogens, these fungicides induce physiological alterations in many crops, particularly cereals. The resulting longer retention of green leaf tissue and significant yield enhancements are very exciting potential benefits of the strobilurins in agriculture. Such bioregulatory

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effects, leading to retarded senescence and intensified green leaf pigmentation may be due to several factors, including broad control of pathogens and saprophytes and inhibition of ethylene biosynthesis (pg. 5, left column, 4<sup>th</sup> paragraph).

Müller et al. teach combinations of pyraclostrobin with kresoxim-methyl or epoxiconazole in the presence of a surfactant (Examples 7 and 25).

*Ascertainment of the difference between the prior art and the claims*

*(MPEP 2141.02)*

Bartlett et al. and Gullino et al. do not explicitly disclose combining pyraclostrobin with prohexadione-Ca or Co<sup>++</sup> ions, as instantly claimed. However, they both teach that the unexpected superior physiological activity is due in part to the inhibition of ethylene biosynthesis. Thus, it would have been *prima facie* obvious to add inhibitors of ethylene biosynthesis. Elad teaches that Co<sup>++</sup> ions are also ethylene biosynthesis inhibitors (Abstract). Grover et al. teach that Co<sup>2+</sup> is a powerful inhibitor of ethylene biosynthesis (Abstract). Rademacher et al. teach compositions comprising the combination of ethylene biosynthesis inhibitors and plant growth retardants, such as prohexadione-Ca (Abstract). Rademacher et al. further teach that the compositions are best carried out at low rate applications, wherein surprising and unexpected results were obtained since superior results were achieved at low rates (col. 5, ln. 39-41).

*Finding of prima facie obviousness*

*Rational and Motivation (MPEP 2142-43)*

Therefore, it would have been *prima facie* obvious for one of ordinary skill in the art at the time of the invention to combine the strobilurin, pyraclostrobin, as reasonably

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taught by Bartlett et al., with inhibitors of ethylene biosynthesis, such as  $\text{Co}^{++}$  ions, in order to retard senescence and intensify green leaf pigmentation, as reasonably taught by Elad and Grover et al., as well as combine prohexadione-Ca and azoles to prevent leaf necrosis.

From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

### ***Response to Arguments***

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicant further argues that even if the Office action made the *prima facie* case, the combination of pyraclostrobin and prohexadione-Ca provides an unexpectedly superior reduction of ethylene production, as evidenced by the declaration by Dr. Lutz Brahm filed 28 October 2010. Dr. Brahm provides data comparing pyraclostrobin at 25

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g/ha (increase in ethylene production of 1.7% and 19.7% at 22h and 44h, respectively), prohexadione-Ca at 25 g/h (decrease of 3.2% at 22 h and increase of 1% at 44 h), and the combination of pyraclostrobin and prohexadione-Ca, each at 25 g/ha (decrease of 12.8% and 28.8% at 22h and 44h, respectively). Dr. Brahm states that the expected ethylene production for the combination is an increase of 17.3% and 33.5% at 22h and 44h, respectively, calculated using Colby's formula. Dr. Brahm further states that the results demonstrate that the efficacy of the combinations of the active compounds to reduce ethylene production shown in table 1 is higher at 22 or 44 hours after treatment than the expected efficacy calculated using Colby's formula.

The examiner respectfully argues that the declaration is not commensurate in scope with the claims since the only ratio of pyraclostrobin to prohexadione-Ca tested is 1:1, and the only concentration of pyraclostrobin and prohexadione-Ca tested is 25 g/ha. The instant claims are drawn to any concentration and a weight ratio of from 20:1 to 0.05:1 of pyraclostrobin to prohexadione-Ca.

The examiner also respectfully argues that Rademacher et al. teach the combination of plant growth retardants and inhibitors of ethylene biosynthesis or action (Abstract; col. 3, ln. 5-30). Rademacher et al. teach that the method and composition of their invention are best carried out at low rate applications (col. 4, ln. 66-67), such as a single application rate of lower than about 50 g ai/ha (col. 5, ln. 1-17). Rademacher et al. teach that preferred formulations of the low rate application include those formulations that provide an ethylene inhibitor in an effective amount to obtain consistent improvement in a plant growth factor (col. 5, ln. 24-36). Rademacher et al.



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further teach that their invention provides surprising and unexpected results since it obtains superior results at low rates. Rademacher et al. further teach examples wherein their data demonstrate that application rates of less than 50 g ai/ha provided the most consistent and maximum response (col. 8, ln. 1-3 and 26-28; col. 9, ln. 13-17; col. 10, ln. 16-21 and 43-51; and claims 1-2).

Therefore, it was not unexpected that low rates of application of ethylene biosynthesis inhibitor and plant growth retardant would result in superior activity when compared with higher doses, and each active individually.

### **Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan W. Schlientz whose telephone number is (571)272-9924. The examiner can normally be reached on 9:00 AM to 5:30 PM, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann R. Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NWS

/John Pak/

Primary Examiner, Art Unit 1616